

JANUARY 27.

The President, Dr. RUSCHENBERGER, in the chair.

Thirty members present.

Henry A. Muhlenberg, of Reading, Pa., George De B. Keim, Henry Tagg, Chas. S. Whelen, and Charles W. Macfarlane, were elected members.

Jas. Stevenson, U. S. Geol. Surv., was elected a Correspondent.

Prof. COPE made some observations on the age of the lignite and other corresponding formations of the West, and especially its supposed equivalent in Northern Colorado. He referred to his determination of the Upper Missouri formation as cretaceous in 1868; of the Wyoming Bitter Creek series as of the same age in 1872. He now added the Colorado strata to the same, on the evidence of vertebrate remains procured by himself during the past season, in connection with the United States Geological Survey under Dr. F. V. Hayden. These remains consisted of *Dinosauria* of three species, tortoises of five, and a single species of crocodile. Five of the genera were diagnostic. The *Dinosauria* were referred to the old genus *Hadrosaurus* and the new genera *Polygonax* and *Cionodon*. The *Cionodon arctatus* was a large herbivorous saurian, allied to *Hadrosaurus*, but with a most complex and singular type of dentition; the size that of a horse. The other two species are much larger.

He also pointed out that the tortoises are identical with species discovered by Dr. Hayden in the Fort Union formation of Dakota. He identified the Colorado beds with this group, and believed that they are therefore of cretaceous age, stating that it was the first time such identification had been made.

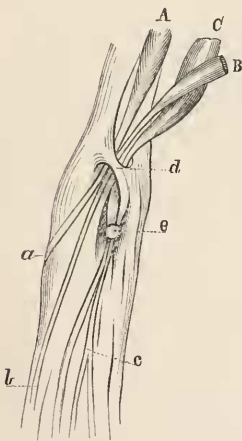
Prof. Cope then discussed the age of the coal and lignite formations west of the Missouri River, and stated that Dr. Hayden had divided them into several epochs, viz., the Placer Mountain (New Mexico); Cañon City (Colorado); Fort Union (Dakota); and Bear River (Wyoming); and that Mr. Meek and himself had regarded the Bitter Creek series as distinct from the others. He stated that the stratigraphers and vegetable palæontologists had regarded all these beds as tertiary, but he believed that the animal and especially the vertebrate palæontology required their reference to the cretaceous period. He observed that Mr. Meek had pointed out the cretaceous age of the Bear River beds. LeConte had insisted on the same reference for the Cañon City basin. Mr. King and himself had determined that the Bitter Creek coal was cretaceous, and he had asserted that the Fort Union epoch belonged to the same division of geologic time, in Dakota in 1869, and for

Colorado at the last meeting of the Academy, although LeConte and others had regarded them as probably miocene.¹ He stated, moreover, that the evidence from palæontology was discrepant, and that it must be conceded that a tertiary flora was contemporary with a cretaceous fauna. He quoted Dr. Hayden as having shown that there was no physical interruption in the series of deposits above enumerated, and that the incongruity in the palæontology is to be regarded as evidence that no extinction or re-creation of a general character had taken place during this time; that the apparent interruption in the vertebrate life in the disappearance of large land saurians and appearance of land mammalia is due to the irruption of the latter by migration probably from the south.

FEBRUARY 3.

The President, Dr. RUSCHENBERGER, in the chair.

Eighteen members present.



Dr. CHAPMAN exhibited a dissection of one of the hind legs of a muskrat, *Fiber zibethicus*. The tendons of the tibialis anticus (*a*), extensor proprius hallucis (*b*), and extensor longus digitorum (*c*), pass down a groove in the tibia and under a little process of bone (*d*). The extensor longus digitorum is held down by an additional process (*e*). This arrangement seems to quicken the extension of the foot, and is of use apparently to the animal in swimming.

Remarks on Protozoa.—Prof. LEIDY remarked that while it was exceptional to find the same species of the higher subkingdoms in the different parts of the world, it appeared to be the rule that most species of *Protozoa* were found everywhere under the same conditions. A large number of our fresh-water forms he had recognized as the same as those described by European authors. A less number of species are probably peculiar to every region. Among our fresh-water *Rhizopods* he had observed not only the genera *Amœba*, *Arcella*, *Difflugia*, *Euglypha*, *Trinema*, *Lagynis*, *Actinophrys*, etc., but also most of the species of these as indicated by European naturalists.

¹ LeConte, Notes on Geol. Pacific R. R. Co., 1868, p. 65.